L Number	Hits	Search Text	DB	Time stamp
1	2998	sensor$6 with timer$5 with (detect$6 monitor$5)	USPAT	2003/09/16 11:21
2	7	(sensor$6 with timer$5 with (detect$6 monitor$5)) and 709/$.ccls.	USPAT	2003/09/16 11:19
3	69	rita near ziemer	USPAT	2003/09/16 11:12
4	14	(sensor$6 with timer$5 with (detect$6 monitor$5)) and 714/$.ccls.	USPAT	2003/09/16 11:19
5	37	(sensor$6 with timer$5 with (detect$6 monitor$5)) and (370/$ 709/$ 713/$ 714/$).ccls.	USPAT	2003/09/16 11:40
6	1	("6591296").PN.	USPAT	2003/09/16 11:48
7	0	6591296.pn. and (network$5)	USPAT	2003/09/16 11:48
8	0	6591296.pn. and (network$5 ethernet$5)	USPAT	2003/09/16 11:49
9	1	6591296.pn. and (network$5 internet$5)	USPAT	2003/09/16 12:41
10	1	6591296.pn. and (predetermin$9 set time$3 threshold$5)	USPAT	2003/09/16 12:45
11	414	(arithmetic$5 adj unit) with sensor$5	USPAT	2003/09/16 12:48
12	3	(arithmetic$5 adj unit) with ((gas adj turbine$3) (electrical adj generator$5))	USPAT	2003/09/16 12:47
13	280	(arithmetic$5 adj unit) near9 sensor$5	USPAT	2003/09/16 13:33
15	0	6553418.pn. and (predermin$9)	USPAT	2003/09/16 14:22
16	1	6499114.pn. and timer$5	USPAT	2003/09/16 14:23
17	1	6499114.pn. and time$5	USPAT	2003/09/16 16:00
18	1	6499114.pn. and (network$5 internet$5 ethernet$5)	USPAT	2003/09/16 14:29
19	1	6499114.pn. and (network$5 internet$5 equipment$5 ethernet$5)	USPAT	2003/09/16 14:41
20	1	6499114.pn. and (notif$9)	USPAT	2003/09/16 14:42
21	1	6499114.pn. and operator$5	USPAT	2003/09/16 15:52
22	1	6499114.pn. and (suspend$6 delay$5 stop$5 halt$6 stall$5)	USPAT	2003/09/16 16:01
23	68	(suspend$6 delay$5 halt$6 stall$5) with (equipment$5 device$5) with notificat$9	USPAT	2003/09/16 16:02
24	6	((suspend$6 delay$5 halt$6 stall$5) with (equipment$5 device$5) with notificat$9) and (709/$ 714/$).ccls.	USPAT	2003/09/16 16:02
–	1	("6385114").PN.	USPAT	2003/09/15 12:39
–	1	("20020042811").PN.	USPAT; US-PGPUB	2003/09/15 12:41
–	1	("6463479").PN.	USPAT	2003/09/15 12:42
–	1	("20020194386").PN.	USPAT; US-PGPUB	2003/09/15 13:58
–	1	("6553418").PN.	USPAT	2003/09/15 15:52
–	0	6553418.pn. and (notif$9)	USPAT	2003/09/15 16:07
–	0	6553418.uref.	USPAT	2003/09/15 16:07
–	6	(("6240450") or ("6208266") or ("6122603") or ("6088688") or ("6073174") or ("6023507")).PN.	USPAT	2003/09/15 16:10
–	1864	monitor$6 with sensor$6 with (facilit$6 equipment$6)	USPAT	2003/09/15 16:14
–	32	(monitor$6 with sensor$6 with (facilit$6 equipment$6)) and 709/$.ccls.	USPAT	2003/09/15 16:10
–	7	monitor$6 with sensor$6 with (house$5 near9 (facilit$6 equipment$6))	USPAT	2003/09/15 16:15
–	35	timer$6 with (house$6 near9 (facilit$6 equipment$5 television$6 refriger$8 telephone$5))	USPAT	2003/09/15 16:18
–	1	(timer$6 with (house$6 near9 (facilit$6 equipment$6 television$6 refriger$8 telephone$5))) and (709/$ 370/$).ccls.	USPAT	2003/09/15 16:20
–	39	timer$6 with house$5 with (facilit$6 equipment$5 television$6 refriger$8 telephone$5)	USPAT	2003/09/15 16:19
–	1062	timer$6 with set$5 with (facilit$6 equipment$5 television$6 refriger$8 telephone$5)	USPAT	2003/09/15 16:20
–	75	(timer$6 with set$5 with (facilit$6 equipment$5 television$6 refriger$8 telephone$5)) and (709/$ 370/$).ccls.	USPAT	2003/09/15 17:44

–	26	(timer$6 with set$5 with (facilit$6 equipment$5 television$6 refriger$8 telephone$5)) and notif$9 and (709/$ 370/$).ccls.	USPAT	2003/09/15 16:20
–	1	6553418.pn. and (timer$5 inform$6)	USPAT	2003/09/15 17:45
–	0	6553418.pn. and (timer$5 inform)	USPAT	2003/09/15 17:45
–	1	6553418.pn. and (time$5 inform)	USPAT	2003/09/15 17:46
–	40	(kawamichi near hiroaki).in. (sameshima near shigetoshi).in. (kawano near katsumi).in.	USPAT	2003/09/15 18:10

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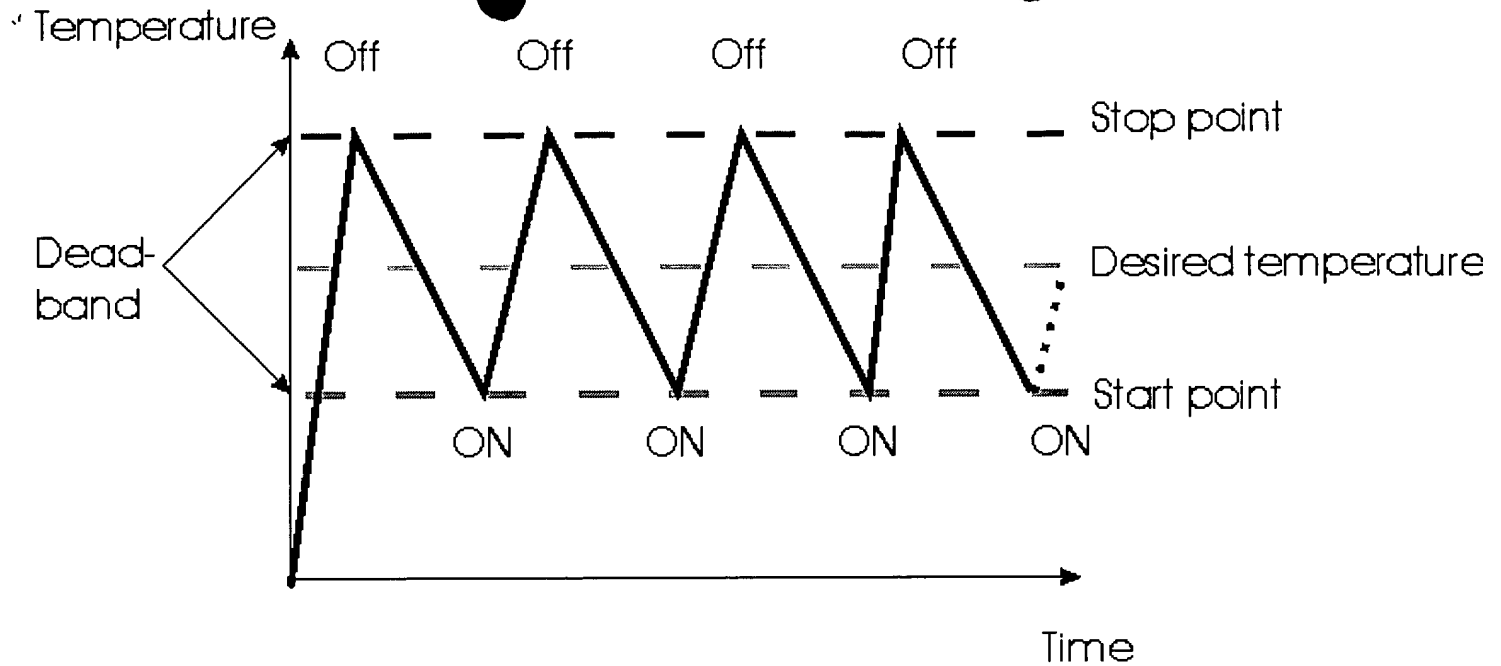
Dead-Band or Hysteresis in Control loops

Understanding Dead-band

Dead-band is most easily understood as a thermostat that keeps your house warm.

When it is cold the heat comes on until the house is warm at which point it stops (this is the stop point). Then, as time goes by, the house cools off and the furnace needs to restart - this would be the start point.

Temperature

Off   Off   Off   Off

Stop point

Dead-
band

Desired temperature

Start point

ON   ON   ON   ON

Time

If the start and stop point are the same value the furnace would go on and off every 30 seconds -causing wear and tear on the fan and wasting fuel. By spreading the start and stop point the furnace runs longer. The difference between the start and stop point is the (**dead-band** or hysteresis of the control loop). Any digital controller can have 100% **dead-band** - older analog systems were sometimes limited in **dead-band** range.

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